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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/803,004

03/17/2004

Thomas Berkey

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IP LEGAL DEPARTMENT
TYCO FIRE & SECURITY SERVICES
ONE TOWN CENTER ROAD
BOCA RATON, FL 33486

EXAMINER

WERNER, DAVID N

ART UNIT

PAPER NUMBER

2621

MAIL DATE

DELIVERY MODE

08/30/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/803,004

Applicant(s)

BERKEY ET AL.

Examiner

David N. Werner

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☒ Claim(s) 6 and 11 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 March 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date 20040317.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: ____.

DETAILED ACTION

1. This is the First Action on the Merits for US Patent Application 10/803,004, which claims priority from Provisional Application 60/502700. Currently, claims 1-21 are pending.

Drawings

2. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "171" and "172" have both been used to designate buffered video data, with "171" appearing in figure 1 and "172" appearing in page 14, line 12 of the specification. Amendments to the specification or corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement-drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

3. Claims 6 and 11 are objected to because of the following informalities: the claims are not in proper Markush format. A Markush claim contains language claiming a genus expressed as a group **consisting of** certain species. See MPEP 2173.05(h), *Ex parte Dotter*, 12 USPQ 382 (Bd. App. 1931). Since the phrase “consisting essentially of” in claim 6 and claim 11 is considered having a different scope as the phrase “consisting of” (MPEP 2111.03), it is improper in a Markush claim. Appropriate correction is required.

Claim Rejections – 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 2, 4-7, 10-15, 17-19, and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 5,185,667 A (Zimmermann). Zimmermann teaches an omnidirectional (wide-angle) imaging system. Regarding claim 1, figure 1 illustrates the system of Zimmermann. Image buffer 4 receives images (column 3: line 31) having a 180-degree field of view (column 3: line 28), corresponding with the claimed “first input buffer”. Image processing system consisting of X-Map 6 and Y-Map 7, coupled to image buffer 4, perform a transform of the image data (column 3: lines 32-35),

corresponding with the claimed "image data processor", and display driver 10 scans the transformed images for display (column 3: line 47), corresponding with the claimed "encoder".

Zimmerman discloses the invention except the reference discloses an output buffer (column 3: line 46), which the present invention explicitly lacks. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to remove an output buffer, since it has been held that omission of an element and its function in a combination where the remaining elements perform the same functions as before involves only routine skill in the art. See *In re Karlson*, 136 USPQ 184.

Regarding claim 2, the images of Zimmermann are composed of pixels (column 4: line 68), and the transformation circuits 6 and 7 perform a transform of distorted hemispherical data to rectilinear data (column 4, lines 22-47) according to known mathematical transformations determined by the parameters of the wide-angle lens (column 3: lines 50-53). Regarding claims 4 and 5, the image processing system is coupled to microcomputer control interface 5, which communicates user-determined transformation coefficients based on input from an input means such as joystick 12 (column 3: lines 35-43). Regarding claim 6, "X-MAP and Y-MAP transform processors 6 and 7...can be accomplished with application specific integrated circuits or other means as will be known to persons skilled in the art" (column 4: lines 1-5). Regarding claims 7 and 10, camera 2 is a source of wide-angle image data (column 3: line 29). Regarding claim 11, Zimmerman outputs data in NTSC format (column 2: lines 25-29).

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The examiner takes Official Notice that it was well within the level of ordinary skill in the art at the time the invention was made to output video in PAL or SECAM format if NTSC output was possible. Regarding claim 12, video is output to display device 11 (column 3: line 47). Regarding claim 13, the output of the transformation circuits is a corrected image, as shown in figure 3 (column 4: lines 36-38).

Regarding claim 14, in Zimmerman, image buffer 4 buffers wide-angle image data, transformation circuits 6 and 7 transform the buffered wide-angle image data into corrected image data, display driver 10 encodes the corrected image data, and display device 11 displays output signals. Regarding claim 15, transformation circuits 6 and 7 perform a transform of distorted hemispherical data to rectilinear data according to known mathematical transformations determined by the parameters of the wide-angle lens 1 in camera 2. Regarding claims 17 and 18, input means 12 provide user image command data to image processors 6 and 7 through microcomputer 5 to transform the buffered wide-angle image into corrected image data, based on calculated parameters determined from user command data. Regarding claim 19, transformation circuits 6 and 7 transform buffered wide-angle image data into corrected image data representative of a substantially undistorted image.

Regarding claim 21, this claim is in means-plus-function format, complying with 35 U.S.C. 112, sixth paragraph. Then, the subject matter of claim 21 is limited to that as described in the specification. In Zimmermann, input image buffer 4 corresponds with the "means for storing", X-map 6 and Y-map 7 correspond with the "means for transforming", and display driver 10 corresponds with the "means for encoding".

6. Claims 3 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmerman in view of US Patent 5,414,521 A (Ansley). Claims 3 and 16 are directed to performing a transformation calculation based on a look-up table. Zimmerman does not disclose this feature.

Ansley teaches an image distortion correction system for a flight simulator. In Ansley, an image is displayed on a curved dome screen. As the pilot's viewing angle changes, distortion becomes apparent and must be mitigated (column 6: lines 3-8). Regarding claims 3 and 16, a computer determines the field of view and viewing angle of the pilot for every possible type of motion for the simulator (column 6: lines 23-35), and determines a set of correction coefficients to eliminate distortion during this motion. These coefficients are stored in a look-up table memory (column 6: lines 35-39). When a certain viewing angle and field of view is received, the look-up memory provides the appropriate coefficients to correct the distortion (column 6: lines 39-66).

Zimmerman discloses the claimed invention except for calculating a distortion correction based on a look-up table. Ansley teaches that it was known to store pre-calculated image distortion correction coefficients in a look-up table memory. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to perform an image correction calculation based on data in a look-up table, as taught by Ansley, since Ansley states in column 6, lines 66-68 that such a modification would greatly increase the speed of a distortion correction process, since the pre-computed values do not have to be re-determined for each new frame.

7. Claims 8, 9, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zimmerman in view of Japanese Patent Application Publication 10-134187 A (House), relying on corresponding US Patent 6,847,392 B1 for translation. Zimmerman teaches determining a normal field-of-view image as a portion of a wide-angle image, and the claimed invention discloses acquiring a normal field-of-view image from a second buffered input source.

House teaches a three-dimensional imaging apparatus. Regarding claims 8 and 9, figure 1 of House shows wide visual field camera 3 and narrow visual field camera 4 (column 5: lines 32-45). Both cameras may be buffered into an input buffer such as the one described in Zimmerman. In House, wide-field camera 3 produces a wide-field image 5, and narrow-field camera 4 produces narrow-field image 6. Regarding claim 20, both images are inputted into image mapping apparatus 12 for processing (column 5: lines 57-60).

Zimmerman discloses the claimed invention except for acquiring a normal field-of-view input image from an additional source. House teaches that it was known to couple a wide-field camera with a narrow-field camera in a single imaging system. Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate a second, narrow-field camera into the system of Zimmerman, as taught by House, since House states in column 6: lines 15-25 that such a modification would enable imaging with both great range and high resolution.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Patent 4,267,573 (Chaikin et al.) discloses an image processing system that performs a piecewise transformation. US Patent 5,329,310 A (Liljegren et al.) teaches a system for mapping an image subject to a first distortion to a second distortion. US Patent 5,384,588 A (Martin et al.) is a continuation-in-part of Zimmerman. US Patent 5,870,135 A (Glatt et al.) and US Patent 6,005,611 A (Gullichsen et al.) are various image correction transformation systems. US Patent 6,389,179 B1 (Katayama et al.) teaches a system for producing a panoramic image from a plurality of narrow-field images. US Patent 6,795,113 B1 teaches a display apparatus for a spherical image. US Patent Application 2002/0141636 A1 (Wakamoto et al.) teaches a wide-angle image correction system. "Fisheye to Rectilinear Conversion" (Atkins) teaches a method for correcting a still image taken with a wide-angle lens.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David N. Werner whose telephone number is (571) 272-9662. The examiner can normally be reached on Monday-Friday from 8:30 AM - 5:00 PM.

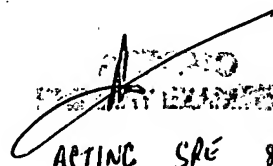
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri, can be reached on (571) 272-7418. The fax phone

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number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DNW


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